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AC, we have $a^2 + b^2 - 2ab\cos B = c^2 + d^2 - 2dc\cos D$. . . . . . (11) Now add to the 4-bar linkage $ABCD$ the bars $B'C'$ and $C'D'$, in such a manner that $AB'C'D'$ shall be a quadrilateral similar to $ABCD$; then the angle $BD'C'$ is the supplement of D. Take P on BC and P' on $D'C$ such that $BP : D'P' = ab : cd$, then the projections BN and $D'N'$ will be proportional to $2ab\cos B$ and $-2dc\cos D$, and therefore in accordance with equation (11) we shall have $BN + N'D =$ a constant, hence also NN' is constant. Since BP is arbitrary any desired value may be given to NN', and since the ratio of similitude of the two quadrilaterals is arbitrary B and D' may be made to coincide.

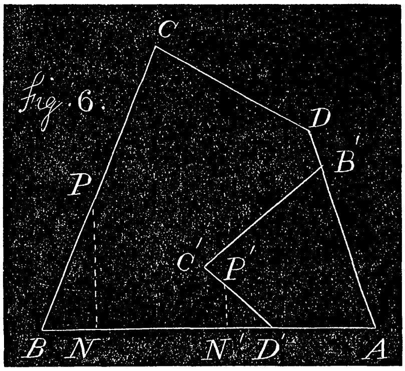
Fig. 6.

Among the various methods in which Mr. Kempe employs this fundamental linkage the following will be intelligible without reproducing the author's analytical work and diagrams.

First, fixing the point P' as a pivot and adding a bar which will cause AB to remain always parallel to a fixed direction (for instance, a bar AO equal and parallel to BP) P will move in the straight line PN.

Secondly, fixing the points B, D' and A (so that the bar AB may be removed), taking BP so that NN' is $\frac{1}{2}BD'$, and adding bars PO, OP' such that $PO = PB$, $P'O = P'D$, O will move in the straight line AB.

Thirdly, fixing the same points making D' coincide with B, and taking BP so that $NN' = 0$; we may make O move in the straight line AB, by taking the bars PO, $P'O$ so that $(P'O)^2 - (PO)^2 = (P'B)^2 - (PB)^2$; or we may make it move in a straight line perpendicular to AB at B, by taking the bars so that $PO = P'B$ and $P'O = PB$.

Fourthly, the same points being fixed and D' still coinciding with B, complete the parallelogram $P'BPR$, if the side RP be produced to O making $PO = PR$ the projection of the broken line BPO is evidently equal to that of the broken line $P'BP$, but this is constant, hence O moves in a perpendicular to AB.

NOTE.—That a revolving ellipsoid of three unequal axes can be in equilibrium is said to be proven in a paper by Mr. Ivory in the *Philosophical Transactions* for 1838, page 57. Cannot some of your subscribers inform us in regard to that paper? Walter Siverly.